TABLE OF CONTENTS

VOLUME 68, 1985

January [1]

***Journal*, pp. 1–44**

1. Demixing of Materials under Chemical Potential Gradients ☆ Takuma Ishikawa, Hiroshi Sato, Ryoichi Kikuchi,, and S. A. Akbar 1
2. Reversible Optical Change of Amorphous Red Phosphorus in Reduced Phosphate Glasses ☆ Hideo Hosono, Takehiko Satake, Masahiro Hosoe, and Yoshihiro Abe 7
3. NMR Line Shape-Spin-Lattice Relaxation Correlation Study of Portland Cement Hydration ☆ L. J. Schreiner, J. C. MacTavish, L. Miljković, M. M. Pintar, R. Blinc, G. Lahajnar, D. Lasic, and L. W. Reeves 10
4. Reaction-Rate-Limiting Steps in Carbothermal Reduction Processes ☆ F. K. Van Dijen, R. Metselaar, and C. A. M. Siskens 16
5. Reactions and Bonding of Sodium Disilicate Glass with Chromium ☆ Antoni P. Tomsia, Zhang Feipeng, and Joseph A. Pask 20
6. Sharp vs Blunt Crack Hypotheses in the Strength of Glass: A Critical Study Using Indentation Flaws ☆ Brian R. Lawn, Karl Jakus, and Armando C. Gonzalez 25
7. Structure and Ionic Mobility of Zirconia at High Temperature ☆ Pierre Aldebert and Jean-Pierre Traverse 34
8. Gas Sensing Characteristics of Porous ZnO and Pt/ZnO Ceramics ☆ Shinichiro Saito, Masaru Miyayama, Kunihito Koumoto, and Hiroaki Yanagida 40
9. Influence of Shear Bands on Creep Rupture in Ceramics ☆ B. J. Dalgleish and A. G. Evans 44

***Communications*, pp. C-2–C-32**

Classification of Ferrospinel Structures and Textures ☆ Ljudmil Bozadgiev, Todora Dimova, and Todor Mitev C-2

Strength and Fracture Toughness of Isostatically Hot-Pressed Composites of Al_2O_3 and Y_2O_3-Partially-Stabilized ZrO_2 ☆ Koji Tsukuma, Kuniyoshi Ueda, and Masahiko Shimada C-4

Sintering and Mechanical Properties of Stoichiometric Mullite ☆ Shuzo Kanzaki, Hideyo Tabata, Takeshi Kumazawa, and Shigetoshi Ohta C-6

Auger Analysis of Hot-Pressed and Sintered Silicon Carbide ☆ Robert Sherman C-7

Kinetics of Precipitation from a Dilute Solid Solution ☆ Anil V. Virkar C-11

Comparison of Data for Thermal Diffusivity Obtained by Laser-Flash Method Using Thermocouple and Photodetector ☆ Hong Lim Lee and D. P. H. Hasselman C-12

The Stability of Pore Channels: Experimental Observations ☆ Michael D. Drory and Andreas M. Glaeser C-14

Effect of Impurity and Carrier Concentrations on Electrical Resisivity and Thermal Conductivity of SiC Ceramics Containing BeO ☆ S. Ogihara, K. Maeda, Y. Takeda, and K. Nakamura C-16

Impact Fracture of Thermally Tempered Glass Helicopter Windshields ☆ Mahmoud M. Abou el leil, Frank A. Camaratta, and Rocco R. DiGenova C-18

Grain-Growth Kinetics for Alumina in the Absence of a Liquid Phase ☆ Stephen J. Bennison and Martin P. Harmer C-22

^{7}Li Nuclear Magnetic Resonance in (^{7}Li,^{6}Li) and (Li,Na) Triborate Glasses ☆ Himanshu Jain, Gert Balzer-Jöllenbeck, and Otmar Kanert C-24

Room-Temperature Mechanical Behavior of Fiber-Reinforced Ceramic-Matrix Composites ☆ T. Mah, M. G. Mendiratta, A. P. Katz, R. Ruh, and K. S. Mazdiyasni C-27

Interaction of Silicon Nitride and Metal Surfaces ☆ Gerald J. Tennenhouse, Andre Ezis, and Franklin D. Runkle C-30

Comment on "Identification of $BaO{\cdot}Al_2O_3{\cdot}5TiO_2$ in the Ternary System $BaO{\cdot}Al_2O_3$-TiO_2 " ☆ Peter E. D. Morgan C-32

February [2]

***Journal*, pp. 49–104**

10. Review—Graphical Displays of the Thermodynamics of High-Temperature Gas-Solid Reactions and Their Application to Oxidation of Metals and Evaporation of Oxides ☆ V. L. K. Lou, T. E. Mitchell, and A. H. Heuer 49
11. Effect of Physical Nature of Powders and Firing Atmosphere on $ZnAl_2O_4$ Formation ☆ H. Okada, H. Kawakami, M. Hashiba, E. Miura, Y. Nurishi, and T. Hibino 58
12. Microstructural Characterization of Synroc C and E by Electron Microscopy ☆ J. A. Cooper, D. R. Cousens, R. A. Lewis, S. Myhra, R. L. Segall, R. St. C. Smart, P. S. Turner, and T. J. White 64
13. Low-Activation-Energy Conduction in Polycrystalline α-Al_2O_3 Doped with Si and Na ☆ C. H. Lee and F. A. Kröger 71

14. Segregation of Isovalent Impurity Cations at the Surfaces of MgO and CaO ☆ P. W. Tasker, E. A. Colbourn, and W. C. Mackrodt 74
15. Surface Tensions of Alumina-Containing Liquids ☆ J. M. Lihrmann and J. S. Haggerty 81
16. Current-Induced Segregation in Ionic Melts ☆ W. T. Petuskey 86
17. Electrical Conductivity of Polycrystalline Al_2O_3 Doped with Silicon ☆ C. H. Lee and F. A. Kröger 92
18. Tracer Diffusion and Electrical Conductivity in Sodium-Rubidium Silicon Sulfide Glasses ☆ M. P. Thomas, N. L. Peterson, and E. Hutchinson 99

***Communications*, pp. C-33–C-72**

Mechanical Properties of Hot-Pressed TiB_2-ZrO_2 Composites ☆ Tadahiko Watanabe and Kazuhisa Shoubu C-34
Effect of Heat Treatment on Fracture Toughness of Alumina-Diamond Composites Sintered at High Pressures ☆ Tatsuo Noma and Akira Sawaoka C-36
Fabrication of Si_3N_4 Ceramics with Metal Nitride Additives by Isostatic Hot-Pressing ☆ Norimasa Uchida, Mitsue Koizumi, and Masahiko Shimada C-38
A New Method of Making Titania Gels and Their Microstructure ☆ Sridhar Komarneni, Rustum Roy, and Else Breval C-41
Interaction of $BaCl_2$ and $BaSO_4$ at Elevated Temperatures ☆ Satish Chandra C-42
New Compound in the System La_2O_3-Al_2O_3 ☆ Osamu Yamaguchi, Koji Sugiura, Akihiro Mitsui, and Kiyoshi Shimizu C-44
Phase Equilibrium in the System $LiAlSiO_4$-$NaAlSiO_4$-SiO_2 ☆ William B. Badger and Floyd A. Hummel C-46
Phase Equilibrium in the System Li_2O-Na_2O-Al_2O_3-SiO_2 ☆ William B. Badger and Floyd A. Hummel C-48
Palmqvist Crack Extension and the Center-Loaded Penny Crack Analogy ☆ Michael T. Laugier C-51
Oxygen Self-Diffusion in Single-Crystal Mn-Zn Ferrite ☆ Hajime Haneda, Hiroshi Yamamura, Akio Watanabe, and Shin-ichi Shirasaki C-53
Stress Rate and Proof-Testing of Silicon Wafers ☆ C. P. Chen and M. H. Leipold C-54
High-Temperature Strength and Fracture Toughness of Y_2O_3-Partially-Stabilized ZrO_2/Al_2O_3 Composites ☆ Koji Tsukuma, Kuniyoshi Ueda, Kenichi Matsushita, and Masahiko Shimada C-56
Glass Transition Temperatures at Rapid Heating Rates ☆ S. W. Twiggs, R. D. Ringle, R. Morena, and C. W. Fairhurst C-58
Preparation of Zirconia-Alumina Powders by Zirconium Alkoxide Hydrolysis ☆ Bruce Fegley, Jr., Paul White, and H. Kent Bowen C-60
A Diffusion-Compensation Relation for Normal Grain Growth and Grain-Boundary Diffusion of Oxygen in Oxides ☆ Raymond Joesten C-62
Analysis of Indentation Crack as a Wedge-Loaded Half-Penny Crack ☆ Dinesh K. Shetty, Alan R. Rosenfield, and Winston Duckworth C-65
Residual Stress Measurements in Alumina and Silicon Carbide ☆ C. O. Ruud and C. P. Gazzara C-67
The System Sc_2O_3-WO_3 ☆ Gary W. Hallum and R. K. Datta C-68
Temperature-Dependent Phase Boundaries for $BaTi_4O_9$, $Ba_4Ti_{13}O_{30}$, and $Ba_6Ti_{17}O_{40}$ ☆ Henry M. O'Bryan, Jr. and John Thomson C-70

March [3]

***Journal*, pp. 105–168**

19. The Al_2O_3-Nd_2O_3 Phase Diagram ☆ J. P. Coutures 105
20. Environmentally Enhanced Crack Growth in Soda-Lime Glass ☆ S. W. Freiman, G. S. White, and E. R. Fuller, Jr. 108
21. Effect of Crystallites on Subcritical Crack Growth and Strain-Rate Sensitivity of Strength of Cordierite Glass-Ceramics ☆ S. Baskaran, S. B. Bhaduri, and D. P. H. Hasselman 112
22. Residual Stresses and Cracking in Metal/Ceramic Systems for Microelectronics Packaging ☆ C. H. Hsueh and A. G. Evans 120
23. Stresses in Dumet-Glass Seals ☆ A. K. Varshneya and J. E. Marra 127
24. Electrical Resistivity and Microwave Transmission of Hexagonal Boron Nitride ☆ H. P. R. Frederikse, A. H. Kahn, A. L. Dragoo, and W. R. Hosler 131
25. Metastability of Tetragonal Zirconia Powders ☆ Maria Isabel Osendi, Jose S. Moya, Carlos J. Serna, and Javier Soria 135
26. Critical Review of the Thermophysical Properties of Fast-Reactor Fuel ☆ J. K. Fink 139
27. Time-Dependent Strength of Siliconized Silicon Carbide under Stress at 1000° and 1100°C ☆ D. F. Carroll and R. E. Tressler 143
28. Characterization of $LiNbO_3$ by Dilatometry and DTA ☆ P. K. Gallagher and H. M. O'Bryan, Jr. 147
29. Comparison of 80-keV D^+ Ion Implantation with Thermal D_2 Doping in Silica by FTIR and ESR Spectroscopy ☆ Masakatsu Saeki, Shin-ichi Ohno, Enzo Tachikawa, Naoto Azuma, Tetsuo Miyazaki, and Kenji Fueki 151
30. Formation and Properties of Calcium Aluminosilicate Glasses ☆ J. E. Shelby 155
31. Crystalline-Phase Formation in Hot Isostatic Pressing of Nuclear Waste Ceramics with High Zirconia Content ☆ Alan B. Harker and John F. Flintoff 159
32. Sodium Transport in the Na_2O-H_2O-SiO_2 Glass System ☆ Joyce Molinelli, Minoru Tomozawa, and Masasuke Takata 165

***Communications*, pp. C-73–C-88**

High-Temperature Cation Distributions in Fe_3O_4-$FeAl_2O_4$ ☆ T. O. Mason C-74
Preparation and Sintering Behavior of Fine-Grained Al_2O_3-SiO_2 Composite ☆ Pierre E. Debély, Eric A. Barringer, and H. Kent Bowen C-76

Resistance of Titanium Diboride to High-Temperature Plastic Yielding ☆ Jeffrey R. Ramberg, Cynthia F. Wolfe, and Wendell S. Williams C-78
Grain Growth in CaO-Stabilized ZrO_2 in the Presence of a Liquid Phase ☆ Shixue Dou, Philip D. Pacey, Charles R. Masson, and Basil R. Marple C-80
Boron Coordination in Rapidly Cooled and in Annealed Aluminum Borosilicate Glass Fibers ☆ Prabhat K. Gupta, Ming L. Lui, and Philip J. Bray C-82
Ion-Exchange Treatment of Silicon-Yttria Dispersions ☆ Gary M. Crosbie C-83
Comment on "Diphasic Zerogels, A New Class of Materials: Phases in the System Al_2O_3-SiO_2" ☆ K. Okada C-85
Reply ☆ Sridhar Komarneni and Rustum Roy C-85
Comment on "Dielectric Properties of Lead-Magnesium Niobate Ceramics" ☆ J. P. Guha C-86
Reply ☆ S. L. Swartz, T. R. Schrout, W. A. Schulze, and L. E. Cross C-87

April [4]

***Journal*, pp. 169–224**

33. Microstructures of $SrTiO_3$ Internal Boundary Layer Capacitors During and After Processing and Resultant Electrical Properties ☆ Masayuki Fujimoto and W. David Kingery 169
34. Phase Equilibria and Ionic Conductivity in the System ZrO_2-Yb_2O_3-Y_2O_3 ☆ G. S. Corman and V. S. Stubican 174
35. Diffusion of ^{51}Cr in Surface Layers of Magnesia, Alumina, and Spinel ☆ V. S. Stubican, G. Huzinec, and D. Damjanović 181
36. Thermodynamic Analysis and Kinetic Implications of Chemical Vapor Deposition of SiC from Si-C-Cl-H Gas Systems ☆ Gary S. Fischman and William T. Petuskey 185
37. Characterization of Corrosion Mechanisms Occurring in a Sintered SiC Exposed to Basic Coal Slags ☆ M. K. Ferber, J. Ogle, V. J. Tennery, and T. Henson 191
38. Grain-Boundary Phase Transformations During Aging of a Partially Stabilized ZrO_2—A Liquid-Phase Analogue of Diffusion-Induced Grain-Boundary Migration (DIGM) (?) ☆ E. P. Butler and A. H. Heuer 197
39. Durability of Glass-Fiber-Reinforced Cements with Different Alkali-Resistant Glass Fibers ☆ A. Bentur, M. Ben-Bassat, and D. Schneider 203
40. Crushing as a Mechanism of Material Removal During Abrasive Machining ☆ T. J. Larchuk, J. C. Conway, Jr., and H. P. Kirchner 209
41. Viscous Sintering on a Rigid Substrate ☆ George W. Scherer and Terry Garino 216
42. Crystallization Behavior of a High-Zinc-Content Li_2O-ZnO-SiO_2 Glass-Ceramic and the Effect of K_2O Additions ☆ Zu-Xiong Chen and P. W. McMillan 220

***Communications*, C-89–C-112**

Effect of Moist Ammonia on the Strength of Polymer-Coated Optical Fibers ☆ Harish C. Chandan and S. Carolyn Perry C-90
Polarized Raman Scattering in Rare-Earth Fluoride Glasses ☆ Bernard Bendow, Pranab K. Banerjee, Jacques Lucas, Gilles Fonteneau, and Martin G. Drexhage C-92
Interface-Reaction-Controlled Kinetics in the Hot Isostatic Pressing of Submicrometer Alumina Powder ☆ Roger R. Wills and John Kevin McCoy C-95
Limitation of Maximum Strength of Zirconia-Toughened Ceramics by Transformation Toughening Increment ☆ Michael V. Swain C-97
High-Temperature Mechanical Properties and Microstructures for Hot-Pressed Silicon Nitrides with Amorphous and Crystalline Intergranular Phases ☆ Sarah H. Knickerbocker, Avigdor Zangvil, and Sherman D. Brown C-99
Coalescence and Crystallization in Powdered High-Cordierite ($2MgO·2Al_2O_3·5SiO_2$) Glass ☆ Koichi Watanabe and Edward A. Giess C-102
Oxygen Pressure Dependence of Lead Ion Transport in PbO-SiO_2 Melts ☆ Uday B. Pal, Tarasankar DebRoy, and George Simkovich C-104
Oxidation and Reduction of Palladium in the Presence of Silver ☆ Sandford S. Cole, Jr. C-106
Barium Titanate Ceramics with High Piezoelectricity Fabricated from Fibrous Particles ☆ Yoshinobu Ohara, Kunihito Koumoto, and Hiroaki Yanagida C-108
Metastable Modification of Y_2GeO_5 ☆ Osamu Yamaguchi, Koji Sugiura, and Kiyoshi Shimizu C-110
Spalling of Flat Plates by Thermal Shock ☆ Michael D. Thouless C-111

May [5]

***Journal*, pp. 225–286**

43. Failure Mechanisms in Ceramic-Fiber/Ceramic-Matrix Composites ☆ D. B. Marshall and A. G. Evans 225
44. Thermodynamic Stability of $UMoO_6$ by the Transpiration Method ☆ S. N. Tripathi, G. Chattopadhyay, A. S. Kerkar, and M. S. Chandrasekharaiah 232
45. Fractoemission from Lead Zirconate-Titanate ☆ J. T. Dickinson, L. C. Jensen, and W. David Williams ... 235
46. Residual Stresses in Metal/Ceramic Bonded Strips ☆ C. H. Hsueh and A. G. Evans 241
47. Kinetics of Liquid Spreading and Penetration with Application to RuO_2-Glass Thick-Film Resistors ☆ D. H. R. Sarma and R. W. Vest 249
48. Surface-Tension-Driven Flow in a Glass Melt ☆ Thomas J. McNeil, Robert Cole, and R. Shankar Subramanian 254
49. Anisotropy of Fracture Toughness of Piezoelectric Ceramics ☆ G. G. Pisarenko, V. M. Chushko, and S. P. Kovalev 259

50. Thermal Reactions to Pyrophyllite Studied by High-Resolution Solid-State ^{27}Al and ^{29}Si Nuclear Magnetic Resonance Spectroscopy ☆ K. J. D. MacKenzie, I. W. M. Brown, R. H. Meinhold, and M. E. Brown ... 266
51. Low-Thermal-Expansion Polycrystalline Zirconyl Phosphate Ceramic ☆ Iwao Yamai and Toshitaka Oota .. 273
52. Parameter-Free Equation-of-State Calculations for MgO and ZrO_2 ☆ L. L. Boyer and B. M. Klein 278
53. Segregation of Mg to the (0001) Surface of Doped Sapphire ☆ S. Baik, D. E. Fowler, J. M. Blakely, and R. Raj 281

Communications, pp. C-113–C-138

Solidification Microstructures of Laser-Melted Alumina Powder Compacts ☆ David H. Matthiesen and William T. Petuskey C-114
Decomposition of Ni_2SiO_4 in an Oxygen Potential Gradient ☆ Jeff Wolfenstine, Duane Dimos, and D. L. Kohlstedt C-117
Particle Size Distributions in Calcined Powders ☆ Kan-Sen Chou, Gee-Yang Tien, and Wen-Long Wu C-118
Free Volume of Metaphosphate Glasses at the Transition Temperature ☆ Suguru Suzuki and Minoru Takahashi C-120
Intrinsic Volume Changes of Self-Propagating Synthesis ☆ Roy W. Rice and William J. McDonough C-122
Effect of Silicon Activity on Liquid-Phase Sintering of Nitrogen Ceramics ☆ Sunggi Baik and Rishi Raj ... C-124
Influence of Gluconate, Lignosulfonate, and Glucose Admixtures on the Hydration of Tetracalcium Aluminoferrite in the Presence of Gypsum with or without Calcium Hydroxide ☆ M. Collepardi, S. Monosi, G. Moriconi, and M. Pauri C-126
Vector Presentation of Liquid Immiscibility in Alkali-Free CaO-FeO-MgO-Al_2O_3-SiO_2-TiO_2 Melts ☆ Lawrence M. Barron C-129
Scandium-Containing Oxynitride Glasses ☆ William K. Tredway and Ronald E. Loehman C-131
Interpretation of Analyses of Silicate Glasses and Minerals Obtained by Secondary-Ion Mass Spectrometry ☆ Jean-Pierre Lacharme and Patrice Lehuede C-134
Reaction Between Ti-6Al-4V and Boron ☆ John W. Steeds and Cecil G. Rhodes C-136
Correction—Coalescence of Two Equal Cylinders: Exact Results for Creeping Viscous Plane Flow Driven by Capillarity ☆ Robert W. Hopper C-138

June [6]

Journal, pp. 287–362

54. Sintering Behavior of Ceramic Films Constrained by a Rigid Substrate ☆ R. K. Bordia and R. Raj 287
55. Outstanding Problems in the Kaolinite-Mullite Reaction Sequence Investigated by ^{29}Si and ^{27}Al Solid-State Nuclear Magnetic Resonance: I, Metakaolinite ☆ K. J. D. MacKenzie, I. W. M. Brown, R. H. Meinhold, and M. E. Bowden 293
56. Outstanding Problems in the Kaolinite-Mullite Reaction Sequence Investigated by ^{29}Si and ^{27}Al Solid-State Nuclear Magnetic Resonance: II, High-Temperature Transformations of Metakaolinite ☆ I. W. M. Brown, K. J. D. MacKenzie, M. E. Bowden, and R. H. Meinhold 298
57. Experimental Procedure for Determining Transport Properties of Oxide Scales ☆ G. Ben Abderrazik, F. Millot, G. Moulin, and A. M. Huntz 302
58. Determination of Transport Properties of Alumina Oxide Scale ☆ G. Ben Abderrazik, F. Millot, G. Moulin, and A. M. Huntz 307
59. Thermochemistry of Sodium Borosilicate Glasses ☆ Richard L. Hervig and Alexandra Navrotsky 314
60. Sintering of Ultrafine Silicon Powder ☆ H.-Joachim Möller and Gerhard Welsch 320
61. Transformation Range Behavior of Lithium Galliosilicate Glasses ☆ Joyce L. Piguet, Josef C. Lapp, and James E. Shelby 326
62. Crystalline Titanate Ceramic Nuclear Waste Forms: Leaching and Radiation Damage ☆ R. G. Dosch, C. J. Northrup, and T. J. Headley 330
63. Reaction between Sodium Carbonate and Silica Sand at $874\,°C < T < 1022\,°C$ ☆ Pavel Hrma 337
64. Elimination of Surface Voids in Ceramics ☆ M. D. Drory and A. G. Evans 342
65. Mixed-Mode Fracture of Hot-Pressed Si_3N_4 ☆ John J. Petrovic 348
66. Transformation of Yttria-Doped Tetragonal ZrO_2 Polycrystals by Annealing in Water ☆ Tsugio Sato and Masahiko Shimada 356
67. Thermodynamic Stability and Incorporation of Phosphorus into Germanium-Doped Silica Glass ☆ Kenneth B. McAfee, Jr., David M. Gay, Kenneth L. Walker, and Robert S. Hozack 359

Communications, pp. C-139–C-158

Fast Firing of a Lead-Iron Niobate Dielectric Ceramic ☆ Michael P. Kassarjian, Bradley H. Fox, and James V. Biggers C-140
Effect of Impurities on SiC Whisker Morphology ☆ K. S. Mazdiyasni and Avigdor Zangvil C-142
Creep Deformation of an Alumina Matrix Composite Reinforced with Silicon Carbide Whiskers ☆ Atul H. Chokshi and John R. Porter C-144
Noncontact Ultrasonic Characterization of Piezoelectric Ceramics ☆ Cheng-Kuei Jen, Paolo Cielo, Xavier Maldague, and Kamal El-Assal C-146
Bridging and Nonbridging Oxygen Atoms in Alkali Aluminosilicate Glasses ☆ Paulette I. K. Onorato, Michael N. Alexander, Charles W. Struck, G. William Tasker, and D. R. Uhlmann C-148
Feasibility Study of the Welding of SiC ☆ Thomas J. Moore C-151
Effect of Additives on the Formation of TiO_2 Particles by Vapor Phase Reaction ☆ Yoko Suyama and Akio Kato C-154
Phase Studies Concerning Sintering in Aluminas Doped with Ti^{4+} ☆ Peter E. D. Morgan and Michael S. Koutsoutis C-156

July [7]

***Journal*, pp. 363–418**

68. Evaluation of Reliability of Brittle Components by Thermal Stress Testing ☆ D. Johnson-Walls, M. D. Drory, A. G. Evans, D. B. Marshall, and K. T. Faber 363
69. Structure-Property Relations in Lanthanide Borate Glasses ☆ Indra N. Chakraborty, Delbert E. Day, Josef C. Lapp, and James E. Shelby 368
70. Solubility of BaO in $BaTiO_3$ ☆ Y. H. Hu, M. P. Harmer, and D. M. Smyth 372
71. Differences in Surface Behavior of Alkali Ions in $Li_2O{\cdot}3SiO_2$ and $Na_2O{\cdot}3SiO_2$ Glasses ☆ S. H. Garofalini and S. M. Levine 376
72. Glass Inhomogeneity Measurement Using the Shelyubskii Method ☆ Arun K. Varshneya, Mike C. Loo, and Thomas F. Soules 380
73. Subeutectic Densification and Second-Phase Formation in Al_2O_3-CaO ☆ Shun Jackson Wu, Lutgard C. De Jonghe, and Mohammed N. Rahaman 385
74. Photoelastic Effects in Phosphate Glasses ☆ Kazumasa Matusita, Chikashi Ihara, Takayuki Komatsu, and Ryosuke Yokota 389
75. Controlled Microwave Heating and Melting of Gels ☆ Rustum Roy, S. Komarneni, and L. J. Yang 392
76. Mechanical Behavior of Lightweight Ceramics Based on Sintered Hollow Spheres ☆ D. J. Green and R. G. Hoagland 395
77. Experimental Study of Porous Gel Sintering ☆ S. Satoh, K. Susa, I. Matsuyama, and T. Suganuma 399
78. Fabrication and Mechanical Properties of Lightweight Ceramics Produced by Sintering of Hollow Spheres ☆ D. J. Green 403
79. Measurement of Small Concentrations of Cr and Fe in α-Al_2O_3 Using Electron Spin Resonance ☆ R. S. de Biasi and D. C. S. Rodrigues 409
80. Fracture of Yttria-Doped, Sintered Reaction-Bonded Silicon Nitride ☆ R. K. Govila, J. A. Mangels, and J. R. Baer 413

Correction—Crystalline-Phase Formation in Hot Isostatic Pressing of Nuclear Waste Ceramics with High Zirconia Content ☆ Alan B. Harker and John F. Flintoff 418

***Communications*, pp. C-159–C-182**

Oxidation of Silicon Nitride Sintered with Rare-Earth Oxide Additions ☆ Diane M. Mieskowski and William A. Sanders C-160

Gamma-to-Alpha Transformation in Spherical Aluminum Oxide Powders ☆ Dennis S. Tucker C-163

Influence of Externally Applied Stresses on Kinetics of Ion Exchange in Glass ☆ A. K. Varshneya and Glenn A. Dumais C-165

Effects of Mechanical Processing on Semiconducting Properties of Barium Titanate ☆ Ahmed Amin and Vishwa Shukla C-167

Suppression of Frothing by Silicon Addition During Oxynitride Glass Synthesis ☆ Sunggi Baik and Rishi Raj C-168

Surface $-OH$ Profile from Reaction of a Heavy-Metal Fluoride Glass with Atmospheric Water ☆ Denis Trégoat, Gilles Fonteneau, Cornelius T. Moynihan, and Jacques Lucas C-171

Crystallization of Hexagonal $BaNb_2O_6$ ☆ Osamu Yamaguchi, Kazuhiro Matsui, and Kiyoshi Shimizu C-173

Characterization of Interfacial Reactions Between β-Al_2O_3 and Y_2O_3-Partially-Stabilized ZrO_2 ☆ S. Jill Glass, Patrick S. Nicholson, and C. Burton Clark C-176

Electrical Conductivity of Alkali-Doped Zr-Ba-La-Al Fluoride Glasses ☆ James E. Shelby C-177

Evaluation of a α-SiC Sintering Using Statistical Methods ☆ Janet B. Hurst and Michael L. Millard C-178

Sodium Diffusion in Sodium Aluminophosphate Glasses ☆ Mohan Rajaram and Delbert E. Day C-181

August [8]

***Journal*, pp. 419–462**

81. Stress in Leached Phase-Separated Glass ☆ George W. Scherer and Martin G. Drexhage 419
82. Microstructural Evolution in a ZrO_2-12 Wt% Y_2O_3 Ceramic ☆ R. Chaim, M. Rühle, and A. H. Heuer 427
83. Hot Corrosion of Sintered α-SiC at 1000°C ☆ Nathan S. Jacobson and James L. Smialek 432
84. Theory for the Load Relaxation Technique in Fracture Studies Using Four-Point-Bend Chevron-Notched Specimens ☆ Thomas B. Troczynski and Patrick S. Nicholson 439
85. Thermodynamic Assessment of the System MnO-NiO ☆ Bill Bergman and John Ågren 444
86. Preparation and Properties of Silver Borate Glasses ☆ Joyce L. Piguet and James E. Shelby 450
87. Stability of Metal Oxide Doped ZnO in Molten Alkali Carbonates ☆ Charles E. Baumgartner 456
88. Electrostriction in Lead Lanthanum Zirconate-Titanate Ceramics ☆ Z. Y. Meng, U. Kumar, and L. E. Cross 459

***Communications*, pp. C-183–C-218**

Phase Characterization of Partially Stabilized Zirconia by Raman Spectroscopy ☆ C. H. Perry, D.-W. Liu, and Robert P. Ingel C-184

Preparation and Properties of Nitrogen-Doped Phosphate Glasses ☆ Mary R. Reidmeyer and Delbert E. Day C-188

Hot-Pressing of SiC with Additions of BaO and C ☆ Tosikazu Sakai and Naoto Hirosaki C-191

Preparation of Submicrometer Al_2O_3 Powder by Gas-Phase Oxidation of Tris(acetylacetonato)aluminum(III) ☆ Kiichiro Kamata, Takao Mochizuki, Shigeki Matsumoto, Akifumi Yamada, and Kikuo Miyokawa C-193

Effect of Atmosphere and Temperature on the Equilibrium between Molten Tin and Soda-Lime Glass ☆ Zhi Hong Liang and Alfred R. Cooper C-195

Cathodoluminescence: A Microstructural Technique for Exploring Phase Distributions and Deformation Structures in Zirconia Ceramics ☆ J. T. Czernuszka and T. F. Page C-196

Feasibility of a Composite of SiC Whiskers in an $MoSi_2$ Matrix ☆ Frank D. Gac and John J. Petrovic C-200
Improvement in Fiber Testing of High-Modulus Single-Filament Materials ☆ Chi-Tang Li and Neal R. Langley C-202
Synthesis of $(Ba,Pb)(Zr,Ti)O_3$ Solid Solution Having No Compositional Fluctuations ☆ Kazuyuki Kakegawa and Jun-ichi Mohri C-204
Thermodynamic Properties of Cerium Oxalate and Cerium Oxide ☆ Sarah Ann Gallagher and Wolfgang Rudolph Dworzak C-206
Eigensolution of the Spinodal Equation ☆ Lawrence M. Barron C-208
High-Temperature Electrical Conductivity of Aluminum Oxynitride Spinel ☆ Il-Ung Kim and Von L. Richards C-210
Strength Recovery in Degraded Yttria-Doped Tetragonal Zirconia Polycrystals ☆ Roger L. K. Matsumoto C-213
Determination of v-K_1 Curves by a Modified Evaluation of Lifetime Measurements in Static Bending Tests ☆ T. Fett and D. Munz C-213
Liquid-Phase Sintering in Thick-Film Resistor Processing ☆ Ponnusamy Palanisamy, Dwadasi H. R. Sarma, and Robert W. Vest C-215
Microstructure of Reaction-Bonded Silicon Nitride Consolidated by Isostatic Hot-Pressing ☆ Diane M. Mieskowski and William A. Sanders C-217

September [9]

***Journal*, pp. 453–514**

89. Viscosity and Thermal Expansion of Mixed-Alkali Sodium-Potassium Borate Glasses ☆ Christopher M. Kuppinger and James E. Shelby 463
90. Mechanical Properties of Joined Silicon Nitride ☆ Sylvia M. Johnson and David J. Rowcliffe 468
91. Silicon Nitride Joining ☆ M. L. Mecartney, R. Sinclair, and R. E. Loehman 472
92. Sintering and Microstructure Formation of β-Silicon Carbide ☆ Doris H. Stutz, Svante Prochazka, and Josef Lorenz 479
93. Damage Analysis of Creep in Bending ☆ A. R. Rosenfield, W. H. Duckworth, and D. K. Shetty 483
94. Electrical Conductivity of PbO-P_2O_5-V_2O_5 Glasses ☆ Hiroshi Hirashima, Daikichi Arai, and Tetsuro Yoshida 486
95. Germanium $K\alpha_{1,2}$ Shifts Due to Coordination ☆ Sei Fukushima, You-Zhao Bai, Yohichi Gohshi, Cheng-Dong Yin, Hideki Morikawa, and Fumiyuki Marumo 490
96. Congruent Composition and Li-Rich Phase Boundary of $LiNbO_3$ ☆ H. M. O'Bryan, P. K. Gallagher, and C. D. Brandle 493
97. Pressure-Temperature Phase Diagram of Zirconia ☆ S. Block, J. A. H. da Jornada, and G. J. Piermarini 497
98. Controlled Transformation and Sintering of a Boehmite Sol-Gel by α-Alumina Seeding ☆ Masato Kumagai and Gary L. Messing 500
99. Influence of Cyclic Tangential Loads on Indentation Fracture ☆ Mei-Chien Lu and A. G. Evans 505
100. Fractoemission from Failure of Metal/Glass Interfaces ☆ L. A. K'Singam, J. Thomas Dickinson, and Leslie C. Jensen 510

***Communications*, pp. C-219–C-262**

A β-Phase Based Superstructure in Bi_2O_3 Doped with PbF_2 ☆ Shigeo Horiuchi and Kenji Uchida C-220
Ruby Glass Produced in a Pt-Au Crucible ☆ Zhi Hong Liang and Alfred R. Cooper C-221
Ultramicrotoming of Ceramic Powders for Electron Microscopy ☆ David G. Pickles and Edward Lilley C-222
Improvement of Crystallinity of $KZr_2P_3O_{12}$ by Sol-Gel Synthesis ☆ Gerard E. Lenain, Herbert A. McKinstry, and Dinesh K. Agrawal C-224
Effect of Nitrogen on the α/β Phase Conversion in Silicon Nitride ☆ Mikio Fukuhara C-226
Thermal Expansion Behavior of Single-Crystal Zirconia ☆ Jane W. Adams, H. Henry Nakamura, Robert P. Ingel, and Roy W. Rice C-228
Transformation-Range Behavior of Li_2O-$(Al,Ga)_2O_3$-SiO_2 Glasses ☆ Joyce L. Piguet and James E. Shelby C-232
Influence of Glass Additions on Particle-Size-Distribution Effects in Tape Casting of $BaTiO_3$ ☆ J. B. Blum and R. J. MacKinnon C-233
Abnormal Grain Growth and Microcracking in Boron Carbide ☆ S. Prochazka, S. L. Dole, and C. I. Hejna C-235
Synthesis of $Hf_{1-x}Zr_xO_2$ ($0<x<1$) with Orthorhombic Symmetry ☆ Ryuji Suyama, Hiroshi Takubo, and Shoichi Kume C-237
Lowering Crystallization Temperatures by Seeding in Structurally Diphasic Al_2O_3-MgO Xerogels ☆ Yoshiko Suwa, Rustum Roy, and Sridhar Komarneni C-238
Flux Growth of Calcium Molybdate Single Crystals ☆ Satish K. Arora, Naresh M. Batra, and G. S. Trivikrama Rao C-240
Effect of Densification Conditions on the Stabilization of the Tetragonal Phase in ZrO_2 Polycrystals ☆ Vimal K. Pujari and Inam Jawed C-242
Preliminary Characterization of Gel Precursors and Their High-Temperature Products by ^{27}Al Magic-Angle Spinning NMR ☆ Sridhar Komarneni, Rustum Roy, Colin A. Fyfe, and Gordon J. Kennedy C-243
Measurement of Cation Diffusion in Silica Light Guides ☆ James W. Fleming, Charles R. Kurkjian, and Un-Chul Paek C-246
High-Temperature Mechanical Behavior of Fiber-Reinforced Glass-Ceramic-Matrix Composites ☆ T. Mah, M. G. Mendiratta, A. P. Katz, R. Ruh, and K. S. Mazdiyasni C-248

Concentration Dependence of the Diffusion Coefficient of Water in SiO_2 Glass ☆ Minoru Tomozawa..... C-251
Effects of α-Radiolysis on Leaching of a Nuclear Waste Glass ☆ William J. Weber, John W. Wald, and Gary L. McVay..... C-253
Liquid-Liquid Phase Separation in Heavy-Metal Fluoride Glass ☆ Michael J. Suscavage and Osama H. El-Bayoumi..... C-256
Liquid-Liquid Immiscibility in Mixed ZrF_4-ThF_4 Glass ☆ Catherine J. Simmons and Joseph H. Simmons... C-258
Transformation Toughening in Composites Containing Dicalcium Silicate ☆ José S. Moya, Pilar Pena, and Salvadore de Aza..... C-259

October [10]

***Journal*, pp. 515–558**

101. Molecular Dynamic Simulation of Eu^{3+}-Doped Sodium Borate Glasses and Their Fluorescence Spectra ☆ Kazuyuki Hirao and Naohiro Soga..... 515
102. Superplastic Deformation in Fine-Grained $MgO{\cdot}2Al_2O_3$ Spinel ☆ P. C. Panda, R. Raj, and P. E. D. Morgan..... 522
103. Relation between Chemical, Mechanical, and Electrical Properties of Nb_2O_5-Modified 95 Mol% $PbZrO_3$-5 Mol% $PbTiO_3$ ☆ R. H. Dungan and L. J. Storz..... 530
104. Structural Dependence on Sintering Temperature of Lead Zirconate-Titanate Solid Solutions ☆ P. Gr. Lucuta, Fl. Constantinescu, and D. Barb..... 533
105. Effect of Interfacial Space-Charge Polarization on the Ionic Conductivity of Composite Electrolytes ☆ N. J. Dudney..... 538
106. Microwave Loss Quality of $BaZn_{1/3}Ta_{2/3}O_3$ Ceramics ☆ S. B. Desu and H. M. O'Bryan..... 546
107. Properties of Lead Fluorosilicate Glasses ☆ James E. Shelby..... 551
108. PTCR Effect in $BaTiO_3$ ☆ G. V. Lewis, C. R. A. Catlow, and R. E. W. Casselton..... 555

***Communications*, pp. C-263–C-290**

Effect of Milling on Slip Casting of Partially Stabilized Zirconia ☆ Hideki Taguchi, Yuzuru Takahashi, and Hiroki Miyamoto..... C-264
Alkali Oxide Rich Sodium Titanates ☆ W. Antony Hill, Anthony R. Moon, and Geoffrey Higginbotham.. C-266
Driving Force for Sintering of Particles with Anisotropic Surface Energies ☆ Alan W. Searcy..... C-267
Densification and Properties of α-Silicon Carbide ☆ Sunil Dutta..... C-269
Fracture Toughness of High-Pressure-Sintered Diamond/Silicon Nitride Composites ☆ Tatsuo Noma and Akira Sawaoka..... C-271
Role of Acid Concentration in Leaching of Cordierite and Alkali Borosilicate Glass ☆ Thomas H. Elmer.. C-273
Crystallization and Transformation of Distorted Tetragonal $YNbO_4$ ☆ Osamu Yamaguchi, Kazuhiro Matsui, Takashi Kawabe, and Kiyoshi Shimizu..... C-275
Resistance to Fracture of a Partially Stabilized Zirconia/ β-Alumina Composite ☆ Thomas B. Troczynski and Patrick S. Nicholson..... C-277
Optical Absorption Spectra of Chlorine-Associated Defect Centers in an Irradiated ZrF_4-Based Glass ☆ E. Joseph Friebele and Danh C. Tran..... C-279
Indenter Flaw Geometry and Fracture Toughness Estimates for a Glass-Ceramic ☆ D. K. Shetty, A. R. Rosenfield, and W. H. Duckworth..... C-282
Monoclinic Crystal Structures of ZrO_2 and HfO_2 Refined from X-ray Powder Diffraction Data ☆ Raiford E. Hann, Paul R. Suitch, and Joseph L. Pentecost..... C-285
Suppression of Insulator Charging During Secondary-Ion Mass Spectroscopy and Scanning Electron Microscopy ☆ Emilio Giraldez, Leonard Dolhert, W. David Kingery, and William T. Petuskey. C-286
Further Comment on "Direct Observation of Crack-Tip Geometry of SiO_2 Glass by High-Resolution Electron Microscopy" ☆ N. H. Macmillan..... C-288
Comment on "Intermediate-Stage Sintering of a Homogeneously Packed Compact" ☆ Xiang-min Li..... C-290
Reply ☆ Takayasu Ikegami and Yusuke Moriyoshi..... C-290

November [11]

***Journal* pp. 559–640**

109. Study by Extended X-ray Absorption Fine-Structure Technique and Microscopy of the Chemical State of Yttrium in α-Polycrystalline Alumina ☆ M. K. Loudjani, J. Roy, A. M. Huntz, and R. Cortes..... 559
110. Strength and Fatigue Properties of Optical Glass Fibers Containing Microindentation Flaws ☆ Timothy P. Dabbs and Brian R. Lawn..... 563
111. Localization of Potassium in Al_2O_3 ☆ D. W. Susnitzky and C. B. Carter..... 569
112. Duality in the Creep Rupture of a Polycrystalline Alumina ☆ B. J. Dalgleish, E. B. Slamovich, and A. G. Evans..... 575
113. Grain-Boundary Characteristics and Their Influence on the Electrical Resistance of Barium Titanate Ceramics ☆ Georg Koschek and Erich Kubalek..... 582
114. Closure and Repropagation of Healed Cracks in Silicate Glass ☆ Terry A. Michalske and E. R. Fuller, Jr.. 586
115. Swelling of Hot-Pressed Al_2O_3 ☆ S. J. Bennison and M. P. Harmer..... 591
116. Evaluation of Grain-Growth Paramaters ☆ Takayasu Ikegami and Yusuke Moriyoshi..... 597
117. Microstructure-Strength Properties in Ceramics: I, Effect of Crack Size on Toughness ☆ Robert F. Cook, Brian R. Lawn, and Carolyn J. Fairbanks..... 604
118. Microstructure-Strength Properties in Ceramics: II, Fatigue Relations ☆ Robert F. Cook, Brian R. Lawn, and Carolyn J. Fairbanks..... 616

119. Acoustic and Elastic Properties of PZT Ceramics with Anisotropic Pores ☆ M. Kahn 623
120. Effect of Chloride Incorporation on the Crystallization of Zirconium-Barium-Lanthanum-Aluminum Fluoride Glass ☆ George F. Neilson, Gary L. Smith, and Michael C. Weinberg 629
121. Effect of Contact Residual Stress Relaxation on Fracture Strength of Indented Soda-Lime Glass ☆ D. H. Roach and A. R. Cooper 632
122. Glass Formation and Properties in the System Calcia-Gallia-Germania ☆ Paul W. Angel, Chandra S. Ray, and Delbert E. Day 637

Communications, pp. C-291–C-312

Effect of Ba:Ti Ratio on Densification of LiF-Fluxed $BaTiO_3$ ☆ David A. Tolino and John B. Blum C-292
Oxidation Behavior of Oxynitride Glasses ☆ R. R. Wusirika C-294
Evidence for Diffusion of Zerovalent Metal Atoms during Glass/Metal Sealing ☆ William E. Moddeman, Stephen M. Craven, and Daniel P. Kramer C-298
Microstructure and Electrical Properties of Sodium-Diffused and Potassium-Diffused $SrTiO_3$ Barrier-Layer Capacitors Exhibiting Varistor Behavior ☆ Masayuki Fujimoto, Yet-Ming Chiang, Alexana Roshko, and W. David Kingery C-300
Dopant-Free Ultraviolet-Sensitive Calcium Aluminate Glasses ☆ Hideo Hosono, Koji Yamazaki, and Yoshihiro Abe C-304
Leach Resistance of Nitrogen-Containing Na_2O-CaO-SiO_2 Glasses ☆ Günther H. Frischat and Klaus Sebastian C-305
Growth of Potassium Titanate Fibers in Flowing N_2 Gas ☆ Akira Watanabe, Yoshimitsu Takeuchi, and Goji Saeki C-308
Role of Microstructure and Intergranular Phases in Stress Corrosion of TiB_2 Exposed to Liquid Aluminum ☆ Wieslaw A. Zdaniewski C-309

December [12]

Journal pp. 641–407

123. Effect of R^{3+} Ions on the Structure and Properties of Lanthanum Borate Glasses ☆ Indra N. Chakraborty and Delbert E. Day 641
124. Defects and Charge Transport in β-Ta_2O_5: I, Analysis of the Conductivity Observed in Nominally Pure β-Ta_2O_5 ☆ A. E. McHale and H. L. Tuller 646
125. Defects and Charge Transport in β-Ta_2O_5: II, Analysis of the Conductivity of Nb_2O_5-doped β-Ta_2O_5 ☆ A. E. McHale and H. L. Tuller 651
126. Oxygen Sensors Based on the Electrical Conductivity of the Solid Solutions $(Mg_{1-x}Fe_x)O$ and $(Mg_{1-x}Co_x)O$ ☆ Nilo Valverde 657
127. Characterization of the Near-Surface Region of Single-Crystal Alumina Diffusion Samples Using Rutherford Backscattering and Channeling ☆ James D. Cawley, Alain L'Hoir, and Didier Schmaus 663
128. Saturation Factors for Calcium Hydroxide and Calcium Sulfates in Fresh Portland Cement Pastes ☆ Ellis M. Gartner, Fulvio J. Tang, and Stuart J. Weiss 667
129. Dynamic Compaction of Aluminum Nitride Powder: Hugoniot Measurement and Comparison with Static Behavior ☆ W. H. Gourdin and S. L. Weinland 674
130. Analytical Study of Pure and Extended Portland Cement Pastes: I, Pure Portland Cement Pastes ☆ H. F. W. Taylor, K. Mohan, and G. K. Moir 680
131. Analytical Study of Pure and Extended Portland Cement Pastes: II, Fly Ash- and Slag-Cement Pastes ☆ H. F. W. Taylor, K. Mohan, and G. K. Moir 685
132. Ferrous/Ferric Mössbauer Analysis of Simulated Nuclear Waste Glass with and without Computer Fitting ☆ Don S. Goldman and Deborah E. Bewley 691
133. Plastic Deformation in Alumina by Explosive Shock Loading ☆ E. K. Beauchamp, M. J. Carr, and R. A. Graham 696
134. Synthesis of Si_3N_4 with Emphasis on Si-S-N Chemistry ☆ Peter E. D. Morgan and Eloise A. Pugar 699
135. Work of Fracture and Crack Healing in Glass ☆ Michio Inagaki, Kazuhiro Urashima, Shinsuke Toyomasu, Yasuo Goto, and Mototsugu Sakai 704

Communications, pp. C-314–C-338

Synthesis of the Orthorhombic Phase of ZrO_2 ☆ Ryuji Suyama, Toshifumi Ashida, and Shoichi Kume C-314
Formation of ZnO Hemispheres from a Mixed-Nitrate Glass Melt ☆ Daniel Louër C-315
Elastic Properties and Sound Wave Velocity of PZT Transducers Doped with Ta and La ☆ A. Tawfik C-317
Transformation of Yttria-Doped Tetragonal ZrO_2 Polycrystals by Annealing under Controlled Humidity Conditions ☆ Tsugio Sato, Shiro Ohtaki, Tadashi Endo, and Masahiko Shimada C-320
Shock Consolidation of Coarse SiC Powder ☆ Tamotsu Akashi, Victor Lotrich, Akira Sawaoka, and Edwin K. Beauchamp C-322
Fracture Toughness of Ceramics Measured by a Chevron-Notch Diametral-Compression Test ☆ Dinesh K. Shetty, Alan R. Rosenfield, and Winston H. Duckworth C-325
Isothermal Sintering of Spheroidized Cordierite-Type Glass Powders ☆ Edward A. Giess, Carl F. Guerci, George F. Walker, and Sheree H. Wen C-328
Compatibility of AlN with Group VIII Transition Metals ☆ Julius C. Schuster C-329
Segregation at Special Boundaries in MgO ☆ A. Roshko and W. D. Kingery C-331
Effect of Thickness on Direct Bonding of Silicon Nitride to Steel ☆ Katsuaki Suganuma, Taira Okamoto, Mitsue Koizumi, and Masahiko Shimada C-334
Comment on "Fracture on Brittle Solids in the Presence of Thermoelastic Stresses" ☆ Karl Jakus and John E. Ritter, Jr. C-335
Reply ☆ V. D. Krstic C-338